YEARS OF POTENTIAL LIFE LOST

The more traditional approach to cause of death analysis relies on frequency of death. This perspective emphasizes causes of death that affect the elderly, simply because of the larger number of such deaths. Years of potential life lost (YPLL) is an alternative measure that highlights premature, preventable, and unnecessary mortality. There are a number of different calculations for YPLL, each with a slightly different emphasis. Here we use the "premature years of potential life lost" calculation, which is easily understood and is used by the Center for Disease Control and Prevention (CDC). For each decedent younger than 75, the age at death is subtracted from 75. The results are summed by cause of death. This measure is referred to here as YPLL-75.

Frequencies for the ten leading causes of death for Montana residents are reported in **Table 26**. The ten leading causes are: heart disease (23.8% of all resident deaths); cancer (23.7%); chronic lower respiratory diseases (CLRD)—(7.1%); cerebrovascular disease (7.0%); accidents (5.7%); Alzheimer's disease (3.0%); diabetes (2.8%); pneumonia and influenza (2.4%), suicide (2.1%); and nephritis, nephrotic syndrome and nephrosis (1.5%). **Figure 47** represents the traditional view of cause of death analysis, showing the frequency, or number of deaths, in each cause of death category. Montanans of all ages who died of one of the listed causes in 2001 are reflected in this figure.

An alternative perspective, YPLL-75, is shown in **Figure 48**. Only decedents younger than 75 at the time of death are reflected in this figure. Accidents, homicide, and suicide comprise only 8.2% of the deaths in 2001 but accounted for 30.2% of the total losses as measured by YPLL-75. Society's losses include emotional and financial support for families of the decedents and productivity for the economy as a whole. The decedents, of course, lose life itself.

In 2001, the total loss of life before age 75 was 59,944 years. The loss to society resulting from cancer was 20.7% of all years lost. Accidental deaths of any type accounted for 19.6% of total YPLL, with motor vehicle accidents accounting for 12.4% and non-motor-vehicle accidents accounting for 7.2%. Heart disease also caused large losses to society, accounting for 8,079 years lost (13.5%). Other deaths from traumatic injury, suicide and homicide, accounted for 8.5% and 2.1%, respectively. All traumatic deaths together (accidents, homicide, and suicide) accounted for 30.2% of all YPLL-75.

Regardless of which of these two perspectives is used, heart disease and cancer cause a large social loss because of the numbers of deaths they cause, both among decedents of all ages and those less than 75 years of age. The YPLL-75 perspective, however, reorders the ranking of the leading causes of death, highlighting areas the CDC has said "provide the greatest potential for health improvement." Accidental death (both motor vehicle and non-motor-vehicle) was only the fifth leading cause of death using frequency of death, but ranks second in terms of YPLL-75, indicating that accidental deaths are prevalent in those less than 75 years of age and cause great losses to society due to premature death. Suicide ranked ninth by frequency, but became the fourth leading cause when measured by total YPLL-75.

Average YPLL-75 is calculated by dividing the total YPLL-75 for each cause of death by the number of decedents less than 75 years of age. While total YPLL-75 emphasizes the loss to society in terms of years of lost life, average YPLL-75 emphasizes the loss to the individual. This measure is shown in **Figure 49.**

The category "conditions originating in the perinatal period" showed the greatest average loss to an individual (75 years lost). Traumatic causes of death--including motor vehicle accidents (41.3 years), other accidents (32.8), homicide (45.1), and suicide (34.4)—occupied four of the next five highest ranks.

In general, average YPLL-75 was high when median age was low. For instance, Alzheimer's had the lowest associated average YPLL-75, 3.6 years per decedent younger than 75, and the highest associated median age, 87 years. There were several exceptions, however, because average YPLL-75 is influenced by both the age at which decedents died and the number of decedents under age 75 in the cause-of-death category in question.

Figure 47

FREQUENCY OF DEATH BY CAUSE OF DEATH
MONTANA RESIDENTS, 2001

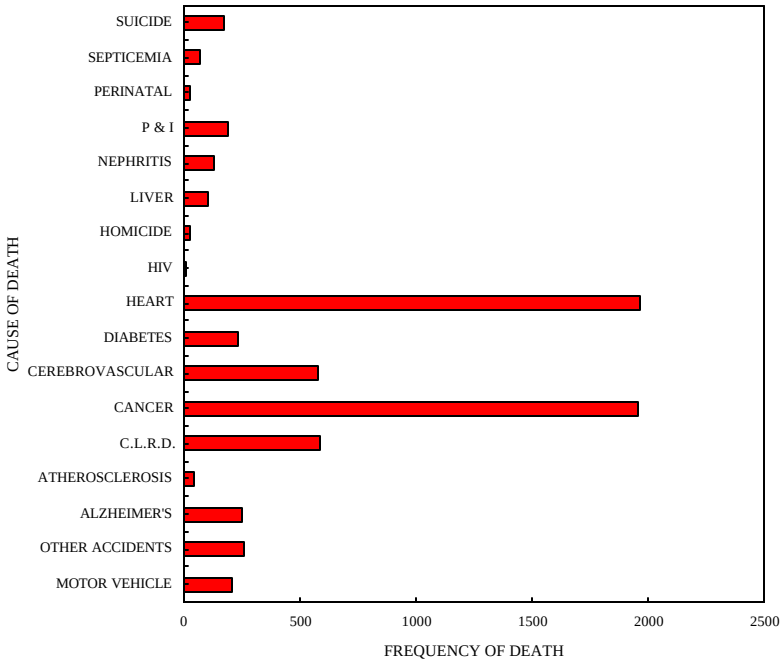

Figure 48

TOTAL YEARS OF POTENTIAL LIFE LOST BEFORE AGE 75
BY CAUSE OF DEATH
MONTANA RESIDENTS, 2001

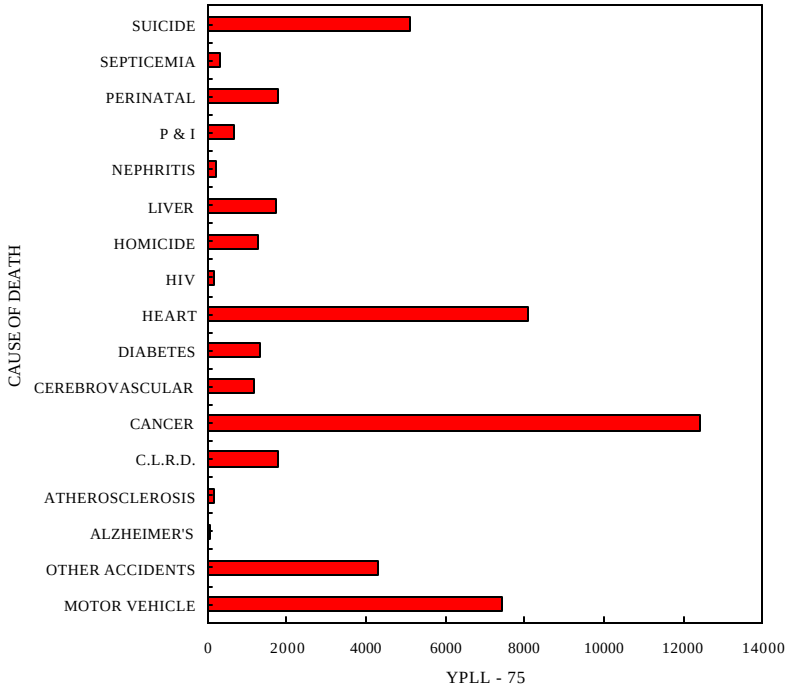

Figure 49

AVERAGE YEARS OF POTENTIAL LIFE LOST BEFORE AGE 75
BY CAUSE OF DEATH
MONTANA RESIDENTS, 2001

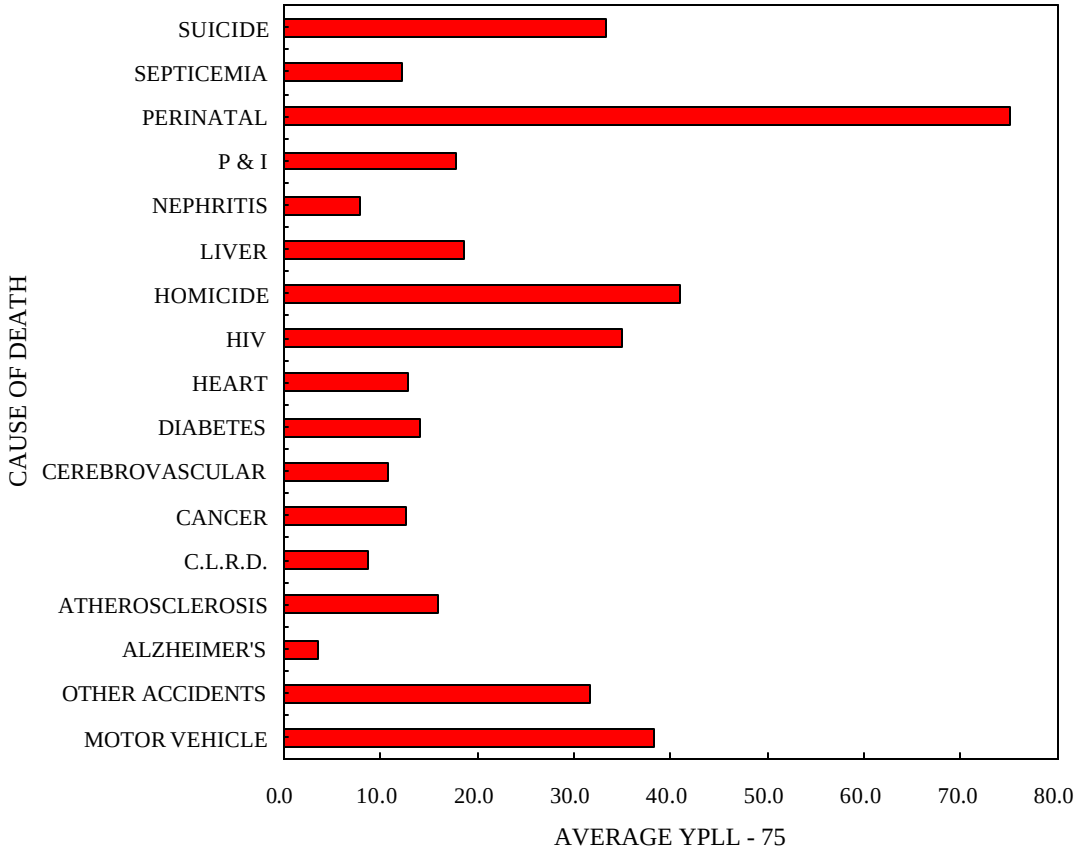

Figure 50 summarizes average and total YPLL-75, frequency of death, and age at death in tabular form for these same 17 causes of death. The left side of the table shows YPLL-75 and related measures--i.e., measures referring to the number of decedents in 2001 who died before the age of 75. The right side of the table shows statistics referring to all decedents, regardless of age. Causes of death are shown in descending order of average years of life lost before age 75.

Average YPLL-75 was highest for those dying of conditions arising in the perinatal period. This is not surprising, since such decedents generally die in infancy or early childhood. Compared to the numbers who died of cancer or heart disease, relatively few residents died of conditions arising in the perinatal period, but all of these decedents contributed the maximum number of years (75) to total YPLL-75.

Figure 50

AGE AT DEATH AND YEARS OF POTENTIAL LIFE LOST BEFORE AGE 75
BY CAUSE OF DEATH
CENTRAL TENDENCY AND DISPERSION*
MONTANA RESIDENTS, 2001

CAUSE OF DEATH	AVERAGE YPLL - 75	NUMBER OF DECEDENTS YOUNGER THAN 75	TOTAL YPLL – 75	MINIMUM AGE	MEAN AGE	MEDIAN AGE	MODAL AGE	MAXIMUM AGE	STANDARD DEVIATION	NUMBER OF DECEDENTS OF ALL AGES
ALL CAUSES	18.3	3,272	59,944	0	73.8	79	83	109	18.2	8,252
Certain Conditions Arising in the Perinatal Period	75.0	24	1,800	0	0.0	0	0	0	0.0	24
Homicide	41.1	31	1,273	0	33.9	37	21	71	18.7	31
Motor Vehicle Accidents	38.2	195	7,449	0	39.8	39	20	93	19.6	209
HIV Infection	35.0	5	175	36	40.0	41	-	44	3.4	5
Suicide	33.4	153	5,106	13	46.7	43.5	39	98	19.6	174
Non-Motor Vehicle Accidents	31.6	136	4,301	0	64.0	71	84	104	25.6	259
Chronic Liver Disease and Cirrhosis	18.7	94	1,754	34	58.6	58	53	90	12.8	103
Pneumonia & Influenza	17.9	37	661	0	82.6	87	89	106	16.3	194
Atherosclerosis	16.0	9	144	49	81.5	85	85	103	14.3	41
Diabetes Mellitus	14.1	94	1,325	24	74.7	78	84	96	14.2	229
Heart Disease	12.9	627	8,079	0	78.0	81	82	107	13.4	1,962
Cancer	12.7	979	12,405	5	72.5	74	79	101	13.3	1,952
Septicemia	12.2	25	306	0	77.0	78.5	77	98	14.9	70
Cerebrovascular Disease	10.8	107	1,153	36	81.9	84	80	100	10.6	577
Chronic Lower Respiratory Diseases (C.L.R.D.)	8.6	207	1,780	36	77.0	78	82	104	9.9	583
Nephritis, Nephrotic Syndrome, and Nephrosis	7.8	29	227	49	82.2	83	86	108	10.7	127
Alzheimer's Disease	3.6	13	47	66	86.2	87	84	100	6.6	248
All Other Causes	23.6	507	11,959	0	74.0	81	83	109	21.4	1,464

* The *mean* is the arithmetic average, the *median* is the midpoint, and the *mode* is the age for the greatest number of decedents. The *standard deviation* measures the concentration of the distribution around the mean.